



PATENT
Docket No.: 53492USA1A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Christopher J. Edge et al.

Serial No.: 08/882,561

Art Unit: 2772

Filed: July 3, 1997

Examiner: Nguyen, K.

For: ARRANGEMENT FOR MAPPING
COLORS BETWEEN IMAGING
SYSTEMS AND METHOD THEREFOR

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

In response to the Notice of Allowance mailed February 14, 2000, Applicants submit the following comments with respect to the Statement of Reasons for Allowance provided by the Examiner.

Applicants have reviewed the Statement of Reasons for Allowance and note that, in support of allowance, the Examiner cited a number of different limitations spanning various claims pending in the present application. Applicants point out that many of the limitations are not required by certain claims. Rather, in most cases, the independent claims set forth in the pending application require only a subset of the limitations cited by the Examiner, but nevertheless define patentable subject matter.

Applicants believe that the Examiner appreciated the differences between the various independent claims, and merely cited the list of limitations collectively in the Statement of Reasons for Allowance for purposes of example. In other words, Applicants believe that the Examiner did not mean to suggest that all of the cited limitations should

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Date: March 2, 2000

Signed: William D. Bauer
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be attributed to each of Applicants' claims. To avoid any confusion, however, Applicants point out below the limitations required by each independent claim in the present application. Applicants believe that such limitations, as set forth in the individual claims, clearly support patentability, consistent with the conclusions reached by the Examiner.

Claim 1, for example, recites a method for transforming colors between source and destination color imaging systems. The method of claim 1 comprises using forward transformation profiles that characterize the source and destination color imaging systems to generate respective sets of device-independent color values for the source and destination color imaging systems, calculating color conversions for different combinations of source and destination color imaging systems by iteratively reducing differences between the respective sets of device-independent color values, constructing color maps describing relationships between the different combinations of source and destination color imaging systems using the color conversions and user preferences, storing the color maps, and when a user requests a transformation for a selected combination of the source and destination color imaging systems and selected user preferences determining whether one of the color maps corresponds to the selected combination and the selected user preferences, if so, retrieving the corresponding color map, and if not, constructing a new color map for the selected combination and selected user preferences.

Claim 7 recites a method for transforming colors between source and destination color imaging systems that comprises using profiles that characterize the color imaging systems to generate device-independent color values for the source color imaging system, the device-independent color values having a same dimensionality as the source color imaging system to generate black channel values independently of other color channel values, using the profiles to perform a color conversion for converting the device-independent color values to device-dependent values of the destination color imaging system, using the color conversion and user preferences to define a color map for transforming colors between the color imaging systems, applying the color map to transform colors between the color imaging systems in the event the color map was defined based on existing user preferences, and in the event the color map was not

defined based on the existing user preferences, using the color conversion and the existing user preferences to redefine the color map, and applying the redefined color map to transform colors between the color imaging systems.

The method of claim 10, for use in transforming colors between source and destination color imaging systems, comprises (a) using profiles characterizing the color imaging systems to generate device-independent color values for the source color imaging system, the device-independent color values having a same dimensionality as the source color imaging system to generate black channel values independently of other color channel values, (b) using the profiles to perform a color conversion for converting the device-independent color values to device-dependent values of the destination color imaging system, (c) using the color conversion to improve the accuracy of the color conversion relative to a quality threshold, (d) returning to step (c) until the color conversion satisfies the quality threshold, (e) using the color conversion and user preferences to define a color map for transforming colors between the color imaging systems, and (f) using the color map to transform colors between the color imaging systems in the event the color map was defined based on existing user preferences, and (g) in the event the color map was not defined based on the existing user preferences, using the color conversion and the existing user preferences to redefine the color map, and applying the redefined color map to transform colors between the color imaging systems.

Claim 11 recites a system for use in transforming colors between source and destination color imaging systems that comprises means for using forward transformation profiles that characterize the source and destination color imaging systems to generate respective sets of device-independent color values for the source and destination color imaging systems, means for calculating color conversions for different combinations of source and destination color imaging systems by iteratively reducing differences between the corresponding sets of device-independent color values, means for constructing color maps describing relationships between the different combinations of source and destination color imaging systems using the color conversions and user preferences, storing the color maps, and when a user requests a transformation for a selected

combination of the source and destination color imaging systems and selected user preferences determining whether one of the color maps corresponds to the selected combination and selected user preferences, if so, retrieving the corresponding color map, and if not, constructing a new color map for the selected combination and selected user preferences.

The method of claim 12, for use in transforming colors between first and second color imaging systems respectively using first and second color coordinate systems, comprises (a) generating first device-independent color coordinates as a function of color coordinates in the first color coordinate system, (b) estimating preliminary color coordinates in the second color coordinate system, (c) generating second device-independent color coordinates as a function of the preliminary color coordinates, (d) adjusting the preliminary color coordinates to reduce an error between the first and second device-independent color coordinates, (e) returning to step (a) until the error satisfies a quality threshold, (f) constructing a color map describing a relationship between the first and second color imaging systems as a function of the adjusted color coordinates and user preferences, (g) using the color map to transform colors between the first and second color imaging systems in the event the color map was defined based on existing user preferences, and (h) in the event the color map was not defined based on the existing user preferences, using the color conversion and the existing user preferences to redefine the color map, and applying the redefined color map to transform colors between the first and second color imaging systems.

Claim 14 recites a system, for use in transforming colors between color imaging systems, that comprises a computer arrangement programmed to use forward transformation profiles that characterize the color imaging systems to generate respective sets of device-independent color values for the color imaging systems, calculate color conversions by iteratively reducing differences between the sets of device-independent color values, and construct a color map describing a relationship between the color imaging systems using the color conversions and user preferences, and a memory, configured and arranged to store the color map, wherein the computer arrangement is further programmed to use the color map to transform colors between the color imaging

systems in the event the color map was defined based on existing user preferences, and in the event the color map was not defined based on the existing user preferences, using the color conversion and the existing user preferences to redefine the color map, and applying the redefined color map to transform colors between the color imaging systems.

Claim 19 recites, for use in transforming colors between source and destination color imaging systems, a data storage medium storing a computer-executable program that, when executed, uses forward transformation profiles that characterize the source and destination color imaging systems to generate respective sets of device-independent color values for the source and destination color imaging systems, calculates color conversions for different combinations of source and destination color imaging systems by iteratively reducing differences between the respective sets of device-independent color values, constructs color maps describing relationships between the different combinations of source and destination color imaging systems using the color conversions and user preferences, stores the color maps, and when a user requests a transformation for a selected combination of the source and destination color imaging systems and selected user preferences determines whether one of the color maps corresponds to the selected combination and the selected user preferences, if so, retrieves the corresponding color map, and if not, constructs a new color map for the selected combination and the selected user preferences.

Claim 39 defines a method for transforming color values between source and destination color imaging devices, the method comprising providing forward transformation profiles for a plurality of color imaging devices, each of the forward transformation profiles defining a transformation of device-dependent color values to device-independent color values for the corresponding color imaging device, specifying transformations of color values by designating combinations of the color imaging devices as source and destination color imaging devices, applying the forward transformation profile for each of the source color imaging devices to produce corresponding source device-independent color values, applying the forward transformation profile for each of the destination color imaging devices to produce corresponding destination device-independent color values, reducing error between the source and destination device-

independent color values for selected combinations of source and destination color imaging devices to generate color conversions, generating device links based on the color conversions, each of the device links defining a transformation of color values for one of the combinations of source and destination color imaging devices, storing the device links, when a user requests transformation for a selected combination of the source and destination color imaging systems determining whether one of the stored device links corresponds to the selected combination, if so, applying the corresponding device link to provide the requested transformation, and if not, constructing a new device link for the selected combination.

Claim 43 recites a data storage medium storing a computer program that, when executed accesses forward transformation profiles for a plurality of color imaging devices, each of the forward transformation profiles defining a transformation of device-dependent color values to device-independent color values for the corresponding color imaging device, processes information specifying transformations of color values by designating combinations of the color imaging devices as source and destination color imaging devices, applies the forward transformation profile for each of the source color imaging devices to produce corresponding source device-independent color values, applies the forward transformation profile for each of the destination color imaging devices to produce corresponding destination device-independent color values, reduces error between the source and destination device-independent color values for selected combinations of source and destination color imaging devices to generate color conversions, generates device links based on the color conversions, each of the device links defining a transformation of color values for one of the combinations of source and destination color imaging devices, stores the device links, when a user requests transformation for a selected combination of the source and destination color imaging systems determines whether one of the stored device links corresponds to the selected combination, if so, applies the corresponding device link to provide the requested transformation, and if not, constructs a new device link for the selected combination.

Claim 47 recites a method for transforming color values between source and destination color imaging devices, the method comprising applying forward

transformation profiles to transform device-dependent color values to device-independent color values for various source and destination color imaging devices, reducing error between the source and destination device-independent color values for selected combinations of source and destination color imaging devices, generating device links based on the error reduction, each of the device links defining a transformation of color values for one of the combinations of source and destination color imaging devices, and applying, for a selected combination of source and destination color imaging devices, a corresponding device link to transform color values for the selected combination.

The data storage medium of claim 48 stores a computer program that, when executed, applies forward transformation profiles to transform device-dependent color values to device-independent color values for various source and destination color imaging devices, reduces error between the source and destination device-independent color values for selected combinations of source and destination color imaging devices, generates device links based on the error reduction, each of the device links defining a transformation of color values for one of the combinations of source and destination color imaging devices, and applies, for a selected combination of source and destination color imaging devices, a corresponding device link to transform color values for the selected combination.

Claim 49 recites a data storage medium storing computer program code that defines device links generated by applying forward transformation profiles to transform device-dependent color values to device-independent color values for various source and destination color imaging devices, and reducing error between the source and destination device-independent color values for selected combinations of source and destination color imaging devices, wherein each of the device links defines a transformation of color values based on the error reduction for one of the combinations of source and destination color imaging devices.

In summary, the pending claims recite a variety of different features and cannot be characterized by a common list of limitations, as perhaps could be misunderstood from the Statement of Reasons for Allowance. Instead, each independent claim, on its own,

recites a combination of limitations that supports patentability. Applicants respectfully request that the comments herein be made of record in the present application.

Respectfully submitted,

Date: March 2, 2000



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